News Release

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BRAIN STIMULATOR KEEPS PILOTS AWAKE

CHARLESTON AIR FORCE BASE, S.C. – The Medical University of South Carolina, located in Charleston, S.C., will be working on a brain stimulation device for possible military use thanks to a contract award from the Defense Advanced Research Projects Agency.

According to an MUSC press release, the overall goal of the contract is to determine if non-invasive stimulation of the brain can improve a soldier's performance, and if so, design, manufacture and test a prototype of a system that would be capable of delivering the technology in the field.

Dr. Mark George, MUSC Transcranial Magnetic Stimulation System developer, said the real challenge in creating the device is to push back sleep deprivation so that people can reach peak performance even when deprived.

"We're not undoing the need for sleep," said George. "We're just trying to find a way to bring highly-trained soldiers to their best when they need to perform."

George used a fighter-pilot example to describe the intentions of the device. During a time of combat, a pilot may be flying a mission from an aircraft carrier. On the way back to the carrier, the pilot may be sleepy. Once he gets near his ship, he will need to focus to land the aircraft. That's when George said the device could be used on the pilot to make sure he lands the aircraft safely.

"We're looking to see if there's a way to give small doses that last for a period of time," said George. "It's distracting while it's being delivered. Maybe we could turn the TMS on for five minutes and have a lasting dose of 10 or 15 minutes."

Current devices George is working with are about the size of a hand. When delivering a dose, George said the device makes a pop, and the wearer can hear the electricity flowing.

"The thin muscle on the scalp gets excited," said George. "You can feel the muscles contracting on the head. It's an odd feeling. It's not really painful, just odd."

The ideal TMS would be a lot smaller than today's version. George said eventually TMSs would be built into fighter pilot's helmets. Since everyone's brain works differently, the device's location would be customized for each helmet.

"Right now, braces hold the TMS to the head," George said. "We put people in the MRI and figure out, personally, what part of the head they use for certain tasks."

If research is successful, George said he would like to build a relationship with Charleston AFB and possibly put the device on pilots in a flight simulator.

"I don't really think there's a problem with pilots falling asleep anyway," said Capt. Scott Weber, 17th Airlift Squadron pilot. "If I'm that tired that I need something to keep me awake, I shouldn't be flying."

Although it's too early to even know if the device will work properly, Weber said unless it's proven, he wouldn't trust a TMS.

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"If it was tested, proven and bought into, I would still hope it would only be used as an aid and not to extend the current duty day in length," said Weber. "When I fly, I try to avoid all forms of caffeine or medicine because I need to fly under the control of my own senses. I don't want my body to rely on habit-forming chemicals or some form of artificial stimulant to keep me awake."

George said it's too soon to know if the project will even work, but he did point out that DARPA has had success on many research projects.

"Stimulants have not received good press," said George. "That's the reason the TMS research is being funded. We've talked with military personnel who love the concept of more focal latitude. This technology would be perfect for that."

George said testing feasibility of the TMS is very important in keeping with the DARPA mission. Even more important to the project is the safety of everyone involved.

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